STATEMENT OF MICHAEL A. CIRILLO, VICE PRESIDENT FOR SYSTEMS OPERATIONS SERVICES, AIR TRAFFIC ORGANIZATION OF THE FEDERAL AVIATION ADMINISTRATION, BEFORE THE COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE, SUBCOMMITTEE ON AVIATION, ON COMMERCIAL JET FUEL SUPPLY: IMPACT AND COST ON THE U.S. AIRLINE INDUSTRY

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Good morning Chairman Mica, Congressman Costello, and Members of the Subcommittee. I'm happy to be here today, testifying on the commercial jet fuel market and its impact and cost to the U.S. aviation industry; and how we can reduce fuel consumption in the aviation industry. This is an enormously important issue, not only for commercial carriers, but for business and general aviation, as well. The Federal Aviation Administration is well aware of the dramatically increasing fuel costs, and we are actively implementing new technologies and procedures to help reduce fuel consumption, while maintaining the highest levels of safety.

Today's aircraft are on average about 70 percent more fuel efficient than aircraft were 40 years ago. Modern aircraft achieve fuel efficiencies of 67 passenger-miles per US gallon. In terms of energy intensity, or the amount of energy consumed to transport one passenger one mile (a useful metric that allows comparisons across transportation modes), an aircraft's energy intensity has improved dramatically since the mid-1960s, and nearly matches that of automobiles today.

The Department of Transportation has a goal to improve aviation fuel efficiency per revenue plane-mile by 1 percent per year, through Fiscal Year 2009. In the near term, new technologies and procedures to improve air traffic management will help reduce fuel usage and emissions. I would like to take a moment to describe some of these technologies and procedures, and how they will help reduce fuel consumption.

One important fuel savings procedure was implemented by the FAA last year. It is known as Domestic Reduced Vertical Separation Minima or DRVSM. DRVSM has significantly increased capacity in the en route airspace by doubling the number of usable altitudes between 29,000 and 41,000 feet. The procedure permits controllers to reduce minimum vertical separation at altitudes between 29,000 and 41,000 feet from 2,000 feet to 1,000 feet for properly equipped aircraft. DRVSM allows greater access to fuel efficient routes that was previously unavailable due to the increased separation requirements. We originally estimated DRVSM would save airlines approximately $5 billion through 2016, an estimate that now appears to be conservative in light of the dramatic increase in fuel prices in the last year.

Another major initiative is expanding the implementation of Area Navigation (RNAV) procedures to additional airports. RNAV procedures are performing successfully at Las Vegas, Philadelphia, and Dulles airports. Last year, 13 RNAV departure procedures and four RNAV arrival procedures went into full operation at Atlanta Hartsfield-Jackson International Airport – the world's busiest airport. These procedures promote reduced fuel usage through more efficient climb and descent gradients; shorter, more predictable, and more repeatable ground tracks, and reduced delays. RNAV procedures provide flight path guidance that is incorporated into onboard aircraft avionics systems, requiring minimal air traffic instructions. This significantly reduces routine controller-pilot communications, allowing more time on frequency for pilots and controllers to handle other safety-critical flight activities. Also, RNAV procedures use more precise routes for take-offs and landings, reducing fuel burn and time intervals between aircraft on the runways, and allowing for increases in traffic, while enhancing safety. Key benefits of the RNAV procedures include more efficient use of airspace, with improved flight profiles, resulting in significant fuel efficiencies to the airlines. In post-implementation studies by MITRE/CAASD, the annual operational benefits from RNAV procedures at Atlanta are estimated to be $15 million. Delta Airlines anticipates potential benefits up to $30 million with refinements to the procedures published in 2005. Additionally, 16 RNAV departures implemented at Dallas/Fort Worth International Airport in 2005 are expected to provide operators with estimated savings of $10 million annually through reduced delays. American Airlines anticipates operational benefits up to $20 million with increased throughput and departure capacity gains. The FAA has over 75 RNAV procedures under development this year.

In the en route environment we plan to publish more than 20 low-altitude and high altitude RNAV routes. The high altitude routes eliminate the need to over-fly ground-based navigation aids and allow the design of more direct, efficient routes. Low altitude RNAV routes allow direct routing through terminal airspace for Global Navigation Satellite System (GNSS) equipped aircraft. These routes are especially useful for general aviation flights, which previously would have been vectored around the terminal airspace. Additionally, last fall nine high altitude off-shore RNAV routes were implemented in Florida as part of airspace optimization efforts which I will address in a moment.

Another technological innovation, known as Required Navigation Performance or RNP, promises to add to capacity and reduce fuel consumption. RNP uses on-board technology that allows pilots to fly more direct point-to-point routes reliably and accurately. RNP is extremely accurate, and gives pilots not only lateral guidance, but vertical precision as well. RNP reaches all aspects of the flight – departure, en route, arrival, and approach. This not only will allow more efficient airspace management, but also provide savings in fuel costs for the airlines. For example, in January 2005, in partnership with Alaska Airlines, we implemented new RNP approach procedures at Palm Springs International Airport, which is located in very mountainous terrain. Under the conventional procedures in use today at Palm Springs, planes cannot land unless the ceiling and visibility are at least 2,300 feet and 3 miles. With these new RNP procedures, approved air carriers can now operate with a ceiling and visibility as low as 734 feet and one mile. This lower landing minima has allowed Alaska Airlines to "save" 27 flights between January and November, 2005, flights which would have otherwise had to divert to Ontario, California, an added distance of at least 70 miles. Additionally, when compared to the conventional procedures at Palm Springs, the RNP approaches will reduce the distance an aircraft has to fly from between 3 miles to nearly 30 miles – which translates into fuel savings for operators. These RNP procedures also provide laterally and vertically guided flight paths from the initial approach fix to the runway end. This attribute keeps aircraft safely separated from terrain and obstacles and in stabilized flight until landing, thus adding a critical margin of safety in prevention of the two major causes of commercial-aviation fatalities: controlled flight into terrain (CFIT) and approach-and-landing accidents (ALAs).

RNP procedures were also published in 2005 for Ronald Reagan Washington National Airport; Portland, Oregon; Hailey, Idaho; and San Francisco. The U.S. is leading the world in RNP. We are working with the international community to establish global standards.

We must also make sure we are using the best technology to maintain a safe and efficient air traffic system. The en route air traffic control computer system is considered the heart of the National Airspace System (NAS). En Route Automation Modernization (ERAM) replaces the software for the Host Computer System and its backup. The ERAM system will be deployed at all 20 Air Route Traffic Control Centers by Fiscal Year 2009. ERAM will enable the FAA to increase capacity and improve efficiency in a way that cannot be realized with the current system, which is a mix of different technologies that evolved over the years and is extremely difficult to expand or upgrade. ERAM will process more than double the number of flight plans, and use almost triple the number of surveillance sources as the current system.

Traffic Flow Management (TFM) is the “brain” of the NAS. The TFM system is the nation's single source for capturing and disseminating traffic information for the purposes of coordinating traffic across the aviation community. As the NAS is impacted by severe weather, congestion and/or outages, the TFM system provides timely information to our customers to expedite traffic and minimize system delays. The FAA is currently in the process of modernizing the TFM infrastructure through its TFM Modernization program. This spring we will introduce the Airspace Flow Management technology to reduce the impact of delays incurred during the severe weather season. FAA estimates show that

TFM provides roughly $340 million in benefits to our customers on a yearly basis in reduced direct operating costs through delay reductions. ERAM and TFM together will enable flexible routing around congestion, weather, and flight restrictions, and help controllers to automatically coordinate flights, during periods of increased workload.

Another area where technology has made it possible to increase capacity, and improve fuel efficiency is Advanced Technologies and Oceanic Procedures (ATOP), or Ocean 21. Ocean 21/ATOP automation adds dependent surveillance, satellite communications, and conflict probe capabilities for oceanic airspace, so that air traffic control can provide more efficient air traffic services, reducing current separation minimums from 100 nautical miles to 50 nautical miles, or 30 nautical miles for appropriately equipped aircraft. This capability permits more aircraft to have access to more fuel efficient trajectories because routes can be spaced more closely together, and aircraft can operate more closely in trail. These more efficient trajectories allow aircraft to operate on better time tracks, with less excess fuel reserves, consequently allowing them to carry extra payload. ATOP went operational at New York last June, and at Oakland last October. Since implementation, oceanic controllers using ATOP are granting 24 percent more requests for changes in altitudes and controller response time has improved by 30 percent. This increased efficiency is even more remarkable considering the 20 percent increase in requests for altitude changes observed in the last year.

The Air Traffic Organization of FAA has also implemented a new technology called the User Request Evaluation Tool or URET. URET permits the controller to predict potential aircraft to aircraft, and aircraft to airspace conflicts earlier, allowing them to construct alternative flight paths or cancel climb or descent restrictions. URET allows these conflicts to be addressed in a strategic sense rather than a tactical sense, with fewer deviations to the route or altitude and less restrictive climb or descent profiles. Fewer deviations can result in less fuel burn. The system makes it easier for controllers to respond to pilot requests for more efficient routings, more fuel efficient altitudes, and wind-optimal routes, all of which can lead to fuel savings. Estimated savings for the aviation industry from URET in FY 2005 are 25 million miles in aircraft travel, and $175 million in operating expenses.

Throughout 2005, a joint team of industry and FAA representatives collaboratively redesigned the airspace in Florida to improve air traffic management efficiency and to reduce airspace complexity. This project is known as the Florida Airspace Optimization. The expected benefits of the airspace redesign for customers include: reduced flight distances on standard arrival and preferential routes into south Florida airports; reduced re-routes into adjoining foreign airspace which cause additional foreign over-flight fees; and reduced departure delays from Boston, New York and Washington, DC metropolitan airports to south Florida destinations. Pre-deployment estimates indicated a cost savings of nearly $20 million per year for airlines. Delays at key south Florida airports have been reduced by 50 percent or more.

The Wide Area Augmentation System, known as WAAS, is another example of using new technology to improve fuel efficiency. WAAS is a satellite-based navigation system that enhances the satellite signals from the Global Positioning System (GPS) to provide increased accuracy and reliability necessary for pilots to rely on satellite navigation during all phases of flight. Because the system is satellite-based, WAAS procedures cost a lot less to implement and maintain than procedures based on traditional ground-based navigation systems. WAAS makes more airspace usable to pilots, provides more direct en route paths, and provides new precision-like approach services to runway ends, all of which can result in fuel savings for operators. The integration of WAAS into the NAS will result in safety and capacity improvements, in addition to reducing fuel consumption. WAAS was commissioned in July 2003 and as of tomorrow there will be nearly 3,800 instrument approaches available to WAAS users, including nearly 1,200 precision-like approaches that offer vertical guidance.

Lastly, one recent development with the potential for significant improvements in reducing fuel consumption for the aviation industry is successful negotiations with Russia to open additional polar routes over Russian airspace. Polar routes are used by traffic between the United States, Russian, and Southeast Asian destinations. These routes significantly reduce fuel burn in comparison to the traditional "Great Circle" routes over the Pacific Ocean. Increased traffic is expected on these routes in future years.

What steps are being taken to reduce aviation fuel consumption in the future? The pace of technological change across the aviation industry is increasing. Aerospace manufacturers continue to develop engine and aircraft designs that are improving fuel efficiency further by reducing weight and improving aerodynamics. Aircraft design improvements mostly fall into one of three categories: weight reduction, aerodynamics, and control systems. New and improved metal alloys and composite materials are being developed to reduce aircraft weight while simultaneously improving structural performance. Aerodynamic improvements include the design of winglets for wing tips, which reduce turbulence and vortex generation by the wings. Significant improvement in control systems has come about by replacing mechanical and hydraulic systems with electrical systems, which often reduce weight while providing more precise control. Improvements of these systems will contribute to improved overall fuel efficiency. However, aircraft technology development follows relatively long cycles, which limits the pace of fundamental changes in design. Therefore, in the near term, the FAA and its Air Traffic Organization are undertaking the air traffic technology development, and operations and procedures improvements spelled out above to help the aviation sector reduce fuel consumption. We take this commitment seriously, and we continuously strive to improve our systems and procedures to provide the safest, most efficient National Airspace System possible.

Mr. Chairman, this concludes my testimony, and I would be happy to answer any questions you may have.